Houston's Accelerated Surface Water Conversion: A Plan For the Future

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Background. The City of Houston, Texas is the fourth largest city in the United States. Over the last two years, the Gulf Coast area, and much of Texas, has experienced record high water demands due to the historical high temperatures, less than normal rainfall and economic development. These factors have required the City to pump high volumes of surface and groundwater to meet these record water demands.

Increased Water Demands. The City's average daily water demands has increased from around 345 MGD to around 425 MGD; approximately a 25% increase over a five (5) year period. Due to groundwater pumpage restrictions and reliability, Houston has met the increase demands by increasing the use of surface water.

The increased use of surface water has also had another benefit to the citizens of our community. Surface water use had directly impacted the rate of ground subsidence that occurs due to groundwater withdrawal. The subsidence rate virtually stopped in the areas where the City is supplying surface water.

Groundwater Limitations. Due to redundancy (backup supply) issues, the City of Houston's water system continues to rely on the more economical groundwater supply. However, due to water quality, water quantity, and subsidence regulatory requirements, the percent of groundwater to total water demand has to be reduced.

The Harris-Galveston Coastal Subsidence District (HGCSD), the State regulatory agency for reducing ground subsidence, has mandated that groundwater pumpage must be reduced. The concentration of projected subsidence coincides with the area of the county with the highest growth rate in development and population. As such, the HGCSD has set a schedule for such reductions due to ground subsidence for the entire county. The District's first critical compliance date is the January 1, 2010.

Additionally, within an eight mile radius from the City's Jersey Village groundwater well field, located in northwest Houston, the City pumps about 50% of the total ground water used. Wells in this area are experiencing severe water quality and quantity problems resulting from declining groundwater recharge in the pumped Evangeline and Chicot aquifers.

Houstons Action Plan. In order to improve the availability and reliability of the area's water supply and achieve the HGCSD's goal of reduced subsidence, in April, 2000 Houston embarked on an accelerated surface water conversion. The Accelerated Surface Water Transmission Program (ASWTP) involves an

estimated $150 million investment in surface water transmission mains over a three year period. Although the HGCSD's first critical compliance date is later, the three year time period was determined by the City to be necessary in order to meet the area's water demands and thereby avoid investing additional monies into groundwater wells.

The ASWTP consists of planning, engineering and construction of over 200,000 linear feet of mostly 84 inch to 48 inch diameter water mains. Goals include increased use of surface water from the current level of 67% of total demand to 80%, eliminate the need for additional groundwater wells, and increased system pressures in the northwest section of the City.

The current schedule provides for the phased increase use of surface water as the projects are completed and placed in service. The entire Program lines are scheduled to be in service by May 31, 2003.

When the Program is complete, an estimated 50 MGD of surface water will be available for use outside of the City's current corporate limits. Thereby providing the Northwest Houston area with a more reliable water supply and help reduce the subsidence rate in the area.

Conclusion. The City of Houston undertook the challenge to accelerate the surface water conversion in northwest Houston in order to meet the area's water demands with a more reliable water system. To accomplish the stated goals, the Accelerated Surface Water Transmission Program was established by the City to provide the mechanism to achieve the stated goals.